

CLAIMS

1. A radar level gauge using microwaves for measuring a level of a surface of a product in a tank, comprising:
 - 5 - an antenna for transmitting microwaves to the surface and receiving microwaves reflected by the surface,
 - measurement circuitry feeding said antenna through a hollow wave guide,
 - characterized in** that the radar level gauge further includes:
 - 10 - an antenna wave guide member, at one end couplable to the antenna and at its other end having an opening in an intersection across the wave guide,
 - a dielectric barrier extending along said intersection across the opening of said antenna wave guide member for non-conductively separating said antenna wave guide member from said measurement circuitry,
 - said dielectric barrier having a first side facing the wave guide in a direction
 - 15 towards the antenna wave guide member
 - said dielectric barrier having a second side facing a direction substantially away from the antenna wave guide member.
2. The radar level gauge according to claim 1, wherein said measurement circuitry
 - 20 comprises a microwave feeder for said feeding of the antenna and said feeder being arranged on said second side
3. The radar level gauge according to claim 1 or 2, wherein a wave guide end piece is
 - 25 arranged at said second side of the dielectric barrier adjacent to said dielectric barrier.
4. The radar level gauge according to claim 2, wherein said dielectric barrier includes a sheet of a solid dielectric material.
5. The radar level gauge according to claim 4, wherein said sheet is provided with one
 - 30 or more through holes.
6. The radar level gauge according to claim 4, wherein said insulation sheet provides
 - 35 both electrical insulation and a protection against longitudinal leakage of material through the wave guide, as said insulation sheet covers the whole area of said opening.
7. The radar level gauge according to claim 4, wherein said antenna wave guide member has a flange for supporting said insulation sheet.

8. The radar level gauge according to claim 4, wherein an enclosure housing said measurement circuitry has an outer wall constituting said insulation sheet.

5 9. The radar level gauge according to claim 4, wherein said insulation sheet on said second side is supported by a flange, which forms a part of an enclosure for the measurement circuitry

10 10. The radar level gauge according to any of the preceding claims, further comprising sealing means provided between the dielectric barrier and the antenna wave guide member to prevent leakage between an inside and an outside of the tank.

15 11. The radar level gauge according to any one of claims 1 to 9, wherein the dielectric barrier includes a dielectric layer of a printed circuit board that forms a part of the measurement circuitry.

20 12. The radar level gauge according to any one of claims 1 to 9, wherein the dielectric barrier has a smallest thickness equal to or greater than a predetermined value required to provide insulation to a given rated voltage.

13. The radar level gauge according to any one of claims 1 to 9, wherein said predetermined value is 0.5 mm.

25 14. The radar level gauge according to any one of claims 1 to 9, wherein, adjacent to the dielectric barrier, the antenna wave guide member by its shape and size forms a quarter wave sealing.

30 15. The radar level gauge according to any one of claims 1 to 9, wherein, adjacent to the dielectric barrier, the antenna wave guide member is provided with at least one quarter-wave choke for the reduction of microwave leakage.

35 16. The radar level gauge according to any one of claims 1 to 9, wherein said dielectric barrier on its second side has a conductive pattern over a part of the wave guide opening to improve an electric matching between the barrier and the wave guide.

17. The radar level gauge according to any one of claims 1 to 9, wherein
- the wave guide is provided with a second wave guide member having a first end coupled to said measurement circuitry,

- said second wave guide member has a second end couplable to the opening of said antenna waveguide member to form a separable joint,
- the dielectric barrier is arranged between the antenna wave guide member and the second wave guide member to provide said non-conductive separation.

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18. The radar level gauge according to any one of claims 1 to 9, wherein said antenna wave guide member has a wall extending along said intersection and that said opening is formed as a slot in said wall.

- 10 19. The radar level gauge according to any one of claims 1 to 9, wherein said intersection is included in an intersectional plane.

20. A method for non-conductively separating a wave guide coupled to an antenna from a measurement circuitry of a radar level gauge for measuring the level of a surface of a product in a tank, the method comprising the steps of:

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- transmitting microwaves to the surface and receiving microwaves reflected by the surface by means of an antenna,
- feeding the microwaves from said measurement circuitry to said antenna through a hollow wave guide

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- providing said wave guide with an antenna wave guide member at one end couplable to the antenna,
- providing the other end of the antenna wave guide member with an opening along an intersection of the antenna wave guide member,
- providing a dielectric barrier along said intersection across said opening of said antenna wave guide member,
- arranging said dielectric barrier to have a first side facing the wave guide in a direction towards the antenna wave guide member and
- arranging said dielectric barrier to have a second side facing a direction substantially away from said antenna wave guide member.

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21. The method of claim 20, further comprising the step of:
- providing a microwave feeder on said second side.

22. The method of claim 19 or 20, further comprising the step of:

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- arranging a wave guide end piece on a side of said dielectric barrier with said end piece facing said second side of the dielectric barrier.

23. The method of claim 20 or 21, further comprising the step of:

- providing a sealing means between the dielectric barrier and the antenna wave guide member to prevent leakage between an inside and an outside of the tank.

24. The method of any of the preceding claims, further comprising the steps of:

- 5 - providing the wave guide with a second wave guide member having a first end coupled to said measurement circuitry,
 - coupling a second end of said second wave guide member to the opening of said antenna wave guide member to form a separable joint,
10 - arranging said dielectric barrier between the antenna wave guide member and the second wave guide member for acting as said non-conductive separation.

25. The method of claim 20 or 24, further comprising the step of:

- 15 - covering the whole opening of the antenna wave guide member with said dielectric barrier